

APPROVED
Montana Department of
Environmental Quality
Permitting and Compliance Division
Rachel S 9.18.12
Reviewer Date

Special Provisions

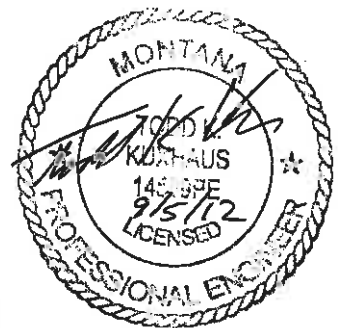
MDEQ Review Submittal

Bearmouth Rest Area Phase I

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MT DEQ PUBLIC WATER
& SUBDIVISION BUREAU

CONTRACT PLANS SPECIAL PROVISIONS (NEW)
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1. INCORPORATION of the MPWSS (Added 5-14-12)

As referenced herein, specific Technical Specifications of the Montana Public Works Standard Specifications, Sixth Edition, April 2010, hereafter collectively referred to as the MPWSS, apply to the project, except where portions of the MPWSS are modified or replaced by the Contract Documents.

2. DEWATERING (Added 5-14-12)

The Contractor will be responsible for any dewatering operations which may be necessary to adequately remove water such that construction activities can be completed as specified. The Contractor will be responsible for conveyance and disposal of water to surface watercourses. Make all necessary arrangements for infringements across private property and obtain and adhere to any necessary discharge permits from the Montana DEQ.

3. TRACER WIRE (Added 5-14-12)

- A. Description. This work is to provide and install tracer wire for the non-metallic buried piping.
- B. Materials. Jacketed #14 copper wire shall be used for detection wire with HDPE and PVC pipe. Jacketed #14 copper detection wire shall be installed on all sewer force mains.
- C. Construction Requirements. All spliced and repaired wire connections in the tracer wire system shall be made using solderless splice kits. No splices will be allowed for wire lengths less than 500 feet. All tracer wire shall be tested by the Contractor prior to final inspection. Contractor shall notify the Engineer 24 hours in advance of the testing.

4. SEPTIC TANK AND DRAINFIELD ABANDONMENT (Added 5-14-12)

The existing septic tanks at the site are to be pumped, cleaned, removed and disposed of in accordance with all local, state and federal regulations. The existing sewer piping and drainfields are to be abandoned in-place.

5. WASTEWATER SYSTEM GENERAL PROVISIONS (Added 5-14-12)

These specifications cover the construction of the wastewater collection, treatment, and disposal system for the Bearmouth Rest Area wastewater system. The contractor shall install a complete, operational wastewater treatment system as specified herein. If the contractor discovers conflicts or inaccuracies in the design and specifications, he shall notify the engineer before ordering said equipment and materials. The Contractor must be a certified installer of standard pressure dosed drainfield systems using infiltrators. Unless specifically noted on the plans and these specifications, all construction shall conform to the 2010 Montana Public Works Standard Specifications, the rules of the State of Montana and Granite County, and the manufacturer's recommendations.

6. SEPTIC TANK (Added 5-14-12)

- A. Description. This work is to provide and install an underground septic tank for the project.
- B. Materials. The septic tank shall be a minimum of 12,500 gallon cast in place concrete or fiberglass. All tanks shall meet standards for septic tanks of the Montana Department of Environmental Quality, Circular DEQ-4. A qualified septic tank manufacturer shall manufacture the tanks. The Contractor shall submit detailed septic tank submittals, which must show compliance with all requirements of Circular DEQ 4 and these specifications. If concrete tanks are selected, the seams and all penetrations shall be grouted with a sand based non-shrink cement grout on both sides. Tanks shall have all pipe penetrations tested for water tightness. Tank construction requirements include, but are not limited to:

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- a. Septic tanks must be made of materials resistant to the corrosive environment found in septic tanks;
 - b. The tanks must be structurally sound and capable of withstanding loads created by six feet of bury;
 - c. The walls and floor of concrete tanks must be at least three inches thick if adequately reinforced with steel and at least six inches thick if not reinforced. Concrete for septic tanks must have a water/cement ratio less than 0.45, a 28-day compressive strength of at least 4,000 psi, and must be made with sulfate resistant cement (tricalcium aluminate content of less than eight percent);
 - d. Concrete covers must be at least three inches thick and adequately reinforced. Concrete access lids must be at least two inches thick;
 - e. The inlet into the tank must be at least four inches in diameter and enter the tank a minimum of three inches above the liquid level;
 - f. Tees or baffles must extend above the liquid level a minimum of seven inches;
 - g. All two-compartment tanks shall be constructed so the second compartment will vent to the first compartment and the first compartment shall vent into the gravity sewer inlet line;
 - h. All septic tanks shall have an air space that is 20 percent or greater than the liquid level;
 - i. Inspection ports must be a minimum of eight inches in diameter and marked with rebar.
- C. Construction. All tanks shall be installed in accordance with that manufacturer's recommendations. All tanks shall be tested for leakage after installation by filling the tanks and measuring any visible leakage over an 8 hour period. Any visible leakage over an 8 hour period, constitute a failure and the tanks shall be repaired or replaced. The Contractor shall coordinate the testing with the Engineer. The Engineer or his representative shall witness the testing. Contractor is responsible for obtaining an installation permit from the Granite County Sanitarian.

7. DOSE TANK (Added 5-14-12)

- A. Description. This work consists of providing and installing a concrete dose tank for the project.
- B. Materials. The dose tank shall meet standards for septic tanks of the Montana Department of Environmental Quality, Circular DEQ 4. The dose tank shall have an operating volume of 1,000 gallons. The dose tank top, lid, and cover shall be traffic rated for HS-20 loading.
- C. Construction Requirements. The Contractor shall submit detailed dose tank specifications showing compliance with all requirements of DEQ 4 and these specifications. 1,000 gallon dose tank shall be installed per plan sheets and specifications.

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8. DRAINFIELD PUMP CONTROLS (Added 5-14-12)

- A. Description. This work consists of providing and installing drainfield pump controls for the project.
- B. Materials. Contractor shall provide a weather resistant control panel with a NEMA 4 enclosure. Contractor to provide floats as shown on the plans. The on float shall turn the lead pump on and the off float shall turn the pumps off. The high level alarm/lag pump on shall be set to activate the alarm and turn on the lag pump. The redundant off/alarm float shall function to activate the alarm and turn off the pumps. All four pumps will be cycled through in sequence with one pump acting as a lead pump and one as a lag pump. The alarm shall remain on until manually silenced and the lag pump shall remain on until water level reaches the off float.
- C. Construction Requirements. All pump controls shall be mounted on a post near the dose tank as shown on the drawings. Final location of the control enclosure to be determined in the field by owner. All pump controls shall be installed in accordance with the manufacturer's recommendations.

9. DRAINFIELD DOSE PUMPS (Added 5-14-12)

- A. Description. This work includes providing and installing four (4) drainfield dose pumps for the project.
- B. Materials. The pumps (4) in the 1,000 gallon dose tank shall be Meyers ME150 effluent pumps, or approved equal. The pumps shall be capable of pumping 65 gallons per minute at 45 feet of total dynamic head and be designed and approved for use with wastewater effluent.
- C. Construction Requirements. Install the dose pumps in accordance with the manufacturer's recommendations and as shown on the drawings.

10. DRAINFIELD DISTRIBUTING VALVES (Added 5-14-12)

- A. Description. This work includes providing and installing two (2) drainfield indexing valves for the project. One extra valve shall be provided to the owner for a spare.
- B. Materials. The valves used to distribute the effluent to the different zones in the drainfield shall be FIMCO 4004F-23 by FIMCO Manufacturing Inc., or approved equal. The valve shall be installed in a 36 inch PVC ribbed access riser with a reinforced fiberglass lid and fitted with insulation as shown on plan details. The valves shall have a zone cycle indicator viewable from the top and able to determine if the valve is cycling correctly. One extra valve shall be provided to the owner for a spare.
- C. Construction Requirements. Install the valves in accordance with the manufacturer's recommendations and as shown on the drawings.

11. DRAINFIELD ELECTRICAL CONTROLS (Added 5-14-12)

The contractor is responsible for ensuring the proper electrical supply is available and routed to the dose tank. Detailed drawings and specifications for the control panels shall be submitted to the engineer for review and approval prior to ordering parts. All federal, state and local electrical codes shall be met.

12. 2" PRESSURE SERVICE AND 4" FORCE MAIN SEWER PIPE (Added 5-14-12)

- A. Description. This work includes providing and installing sanitary sewer force mains for the project.

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- B. **Materials.** The 2-inch diameter pressure service pipe and the 4-inch diameter force main piping shall be HDPE DR-11 and shall meet the requirements of AWWA C901 or C906 and ASTM D3350, with a material designation code of PE 3408, and a cell classification of PE 34-5434C. Use tee or wye fittings for connecting service lines of the same material, construction, and joint design as the main pipe.
- C. **Construction Requirements.** The contractor is responsible for locating all utilities prior to excavation. The contractor will be solely responsible for any damage to existing utilities. All piping shall be bedded and backfilled in accordance with section 02221 and 02730 of the MPW Standard Specifications. Thermally fuse HDPE pipe and fittings by one of the following types of thermal fusion per the manufacturer's recommended procedures: butt fusion, saddle fusion, or socket fusion. Thoroughly clean all pipe segments prior to fusing to assure no HDPE pieces remain in the pipe (these pieces may clog air valves). HDPE pipe and fittings may be joined together through the use of electrofusion fittings with the Engineer's approval. Join HDPE pipe and fittings to other materials with flange adapters with back-up rings, mechanical couplings designed for connecting HDPE pipe and fittings to another material, or mechanical joint adapters. Consult the manufacturer of the joining device for proper installation procedures.

Hydrostatic and Leakage Testing for Force Mains

Perform hydrostatic and leakage testing in accordance with AWWA C600 for all force mains. Once the pipe is laid and backfilled, test for at least 2 hours, all newly laid pipe, or any valved section, at the highest point along the test section. The maximum length of pipe to be tested at one time shall be 3,000 linear feet unless otherwise approved by the Engineer. Test to a hydrostatic pressure equal to the pressure rating of the pipe at the test point, but in no case less than a minimum gage pressure of 135 pounds per square inch (931 kPa) or greater than a maximum gage pressure of 200 pounds per square inch (1,379 kPa).

Slowly fill the pipe with water, purging all air, and apply the test pressure using a pump hooked up so that the pressure and leakage can be measured. To purge the pipe of air during the test, it is necessary to tap the pipe at its highest points if permanent air vents are not located at the high points. Use corporation stops for this purpose. Furnish the pump connections, gauges, stops, and all necessary apparatus for testing.

Disassemble and reassemble all joints showing leakage after thorough cleaning. Remove and replace all cracked or defective pipes or fittings discovered during the pressure test with sound material and repeat the test.

Conduct the leakage test concurrent with the pressure test for 2 hours. Leakage is defined as the quantity of water supplied into the pipe, or any valved section thereof, necessary to maintain pressure within 5 pounds per square inch of the pressure test after the pipe has been filled with water and purged of air.

The pipe installation will be rejected if the leakage exceeds that determined by the following formula:

$$L = SD(P)^{1/2} \div 133,200$$

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In which L equals the allowable leakage in gallons per hour; S is the length of pipe being tested, in feet; D is the nominal diameter of the pipe being tested, in inches; and P is the average test pressure during the leakage test, in pounds per square inch gauge.

Where the pipe being tested for leakage is thermally fused HDPE, the allowable leakage will be reduced to 25% of L, as calculated.

Should any test of pipe laid disclose leakage exceeding that specified above, locate and repair the defective joints until the leakage is within the specified allowance.

Conduct the pressure and leakage tests with the Engineer present.

13. MISCELLANEOUS PIPING (Added 5-14-12)

- A. Description. This work includes providing and installing piping of various types and sizes (excluding the force main and pressure service) for the project.
- B. Materials and Construction Requirements.

Drainfield pressurized pipe:

All pressurized PVC pipe shall meet the requirements of ASTM D1785 (Schedule 40 Class 160), and shall be joined by solvent weld joints. The joints shall be cleaned and totally dry prior to welding. All piping shall be sized as shown in the plans. Exceptions shall be made for the piping in the vault that holds the indexing valves used in the drainfield. The piping coming out of the indexing valve shall be clear for the first four to six inches to allow visual verification of the valve operation.

Drainfield Distribution Lateral Pipe:

2.0 inch diameter PVC meeting the requirements of ASTM D1785 (Schedule 40 Class 160) shall be used, and shall be joined by solvent weld joints. Orifices shall be de-burred of plastic drill cuttings, and all drill cuttings shall be removed from the interior of the pipe. Orifices shall be in a straight line and their final orientation shall be downward facing.

4" Gravity Sewer Pipe:

The 4.0 inch diameter PVC gravity sewer pipe from the building to the septic tank or grinder pumping station shall meet the requirements of ASTM D3034 with an SDR of 35. The gravity pipe shall be installed with a minimum slope of $\frac{1}{4}$ " per foot.

14. DRAINFIELD INSTALLATION (Added 5-14-12)

- A. Description. This work includes providing and installing all materials related to the construction of the drainfields.
- B. General. The drainfield consists of pressure dosed three foot wide infiltrator trenches. There are eight zones 95 feet in length. Each time the dose pumps are engaged, a different zone is dosed, as controlled by a combination of the sequence of dosing pumps and the indexing valves, allowing for even distribution throughout the drainfield.

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- C. **Submittals.** The Contractor shall supply five original product brochures, warranties, and operation and maintenance manuals for each product used in the system. These products shall include but not be limited to the index valves, all pumps, controls, pipes, fittings, alarms, and tanks. All submittals required in this section and these specifications shall be approved prior to ordering or installation of that item.
- D. **Construction Requirements.** The drainfield shall be installed as shown on the plans. The contractor is responsible for system layout and ensuring proper elevations for a complete operational system, according to the plans. The engineer or engineer's representative will determine if soil moisture conditions are appropriate for construction.

The drainfield shall be pressure tested to verify proper installation and operation. The dose tank shall be filled with clean water and the pump engaged in such a manner and for as many times as is necessary to adequately test the system operation. The test shall include verification of float settings (using the water level to activate the floats) and alternation of each of the four duplexed pumps. The drainfield laterals shall be installed per plan, with the ends and manifolds exposed until all testing is complete. Provide orifices drilled at the beginning of the first lateral of each zone and the end of the last lateral in each zone for the purpose of testing. When the pump test has been verified and accepted by the Engineer and the Granite County Sanitarian, the holes drilled into the manifold for pressure testing shall be plugged.

The bottom of the absorption trenches shall be level across the individual drainfield zone. The bottom of the trenches must be at least 12 inches and no more than 36 inches below natural ground surface. There must be a minimum of 6 inches of soil or cover above the infiltrators. The cover must be sloped to provide positive drainage away from the center of the absorption system. The Contractor shall prevent all equipment traffic over the newly installed infiltrator chambers. Construction equipment not needed to construct the drainfields will be kept away from the area to be utilized for the absorption trench system to prevent undesirable compaction of the soils.

15. WESTBOUND REST AREA GRINDER PUMPING STATION (Added 5-14-12)

- A. **Description.** This work includes providing and installing a packaged pumping station capable of pumping raw wastewater from the Westbound rest area to the septic tank located at the Eastbound rest area.
- B. **Materials and Equipment.** Equipment to be used shall be a packaged system meeting the following requirements and as shown on the drawings:
- a. The system shall use grinder pumps.
 - b. Grinder pump stations must be approved by UL or another independent laboratory.
 - c. Alarms shall be provided for high level, low level, and pump failure.
 - d. There shall be two pumps in the pump station each capable of pumping, at minimum, 25 gallons per minute at 75 feet of total dynamic head.

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- e. All submersible pumps and motors must be design specifically for totally submerged operation and must meet the requirements of the National Electric Code for such environments.
 - f. The design must provide for the pumps and motors to be submerged at all times.
- C. Construction Requirements. Install the system in accordance with the manufacturer's recommendations and as shown on the drawings.

16. EASTBOUND REST AREA EFFLUENT PUMPING TANK (Added 5-14-12)

- A. Description. This work includes providing and installing a concrete effluent dose tank and pumping system capable of pumping treated effluent from the eastbound rest area to the dose tank located at the drainfield site.
- B. Materials and Equipment. Equipment to be used shall include the following and as shown on the drawings:
- a. The system shall be capable of storing and pumping treated effluent.
 - b. There shall be two pumps in the pump station each capable of pumping, at minimum, 70 gallons per minute at 79 feet of total dynamic head.
 - c. Alarms shall be provided for high level, low level, and pump failure.
 - d. All submersible pumps and motors must be design specifically for totally submerged operation and must meet the requirements of the National Electric Code for such environments.
 - e. The design must provide for the pumps and motors to be submerged at all times.
 - f. The dose tank shall meet standards for septic tanks of the Montana Department of Environmental Quality, Circular DEQ 4. The dose tank shall have a volume of 4,000 gallons. The dose tank top, access lids and covers shall be traffic rated for HS-20 loading.
- C. Construction Requirements. Install the system in accordance with the manufacturer's recommendations and as shown on the drawings.